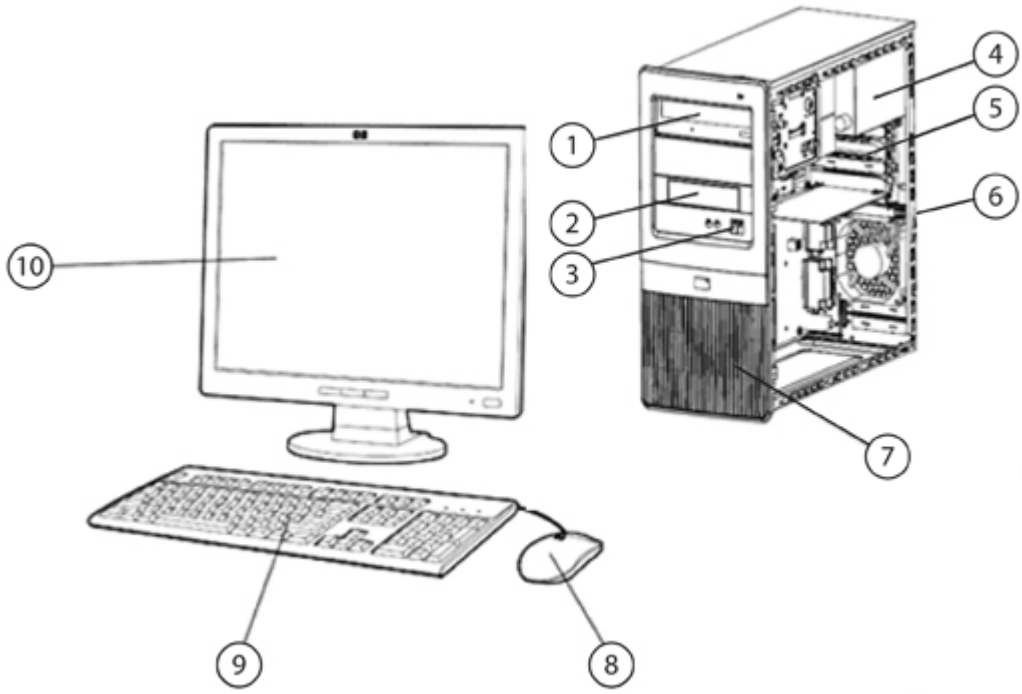
Overview

HP recommends
Windows Vista® Business

Microtower*

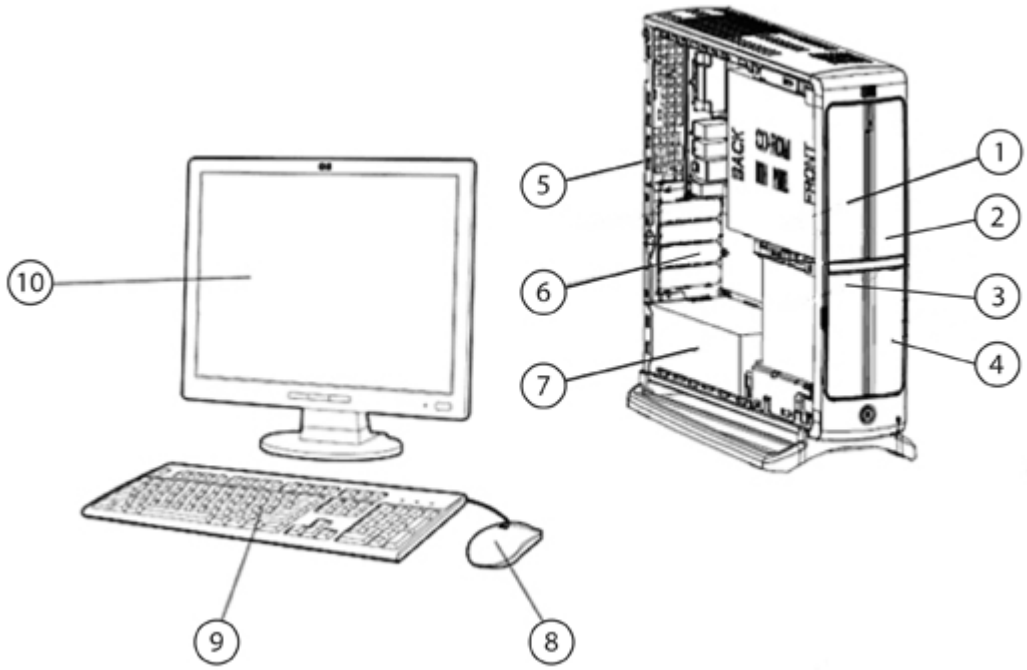


1. (2) external 5.25-inch (13.335 cm) drive bays for optional optical drives
2. (1) external 3.5-inch (8.89 cm) drive bay for optional media reader or diskette drive
3. (2) USB 2.0 ports, audio ports
4. 250W PFC power supply standard, 300W PFC power supply (Korea and China only)
5. (2) full-height PCI 2.3 slots, (1) PCIe x1 slot, (1) PCIe x16 slot
6. (8) USB 2.0 ports, (2) PS/2, (1) RJ-45, (1) VGA, (1) Parallel, (1) COM, (1) audio in, (1) audio out, (1) MIC
7. (2) internal 3.5-inch (8.89 cm) drive bays
8. PS/2 Scroll Mouse
9. HP Standard Keyboard
10. Monitor (sold separately)

* Model dx2710 has a dark colored bezel; model dx2718 (available only in China) has a light colored bezel.

Overview

Small Form Factor



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At A Glance

- Intel® Core™ 2 processors, Intel Pentium® processors, or Intel Celeron® processors
- Choice of operating systems:
  - Genuine Windows Vista Business 32
  - Genuine Windows Vista Home Basic 32
  - Genuine Windows Vista Business 32 downgrade to Windows XP Professional
  - Genuine Windows XP Home Cost Reduced (China only)
  - Red Flag Linux (China only)
  - FreeDOS
- Intel G33 Express Chipset
- Intel I/O Controller Hub 9 (ICH9)
- Intel Graphics Media Accelerator 3100
- PCI and PCI Express I/O buses
- Serial ATA controller
- USB 2.0 support (
- Legacy parallel and serial ports
- Realtek 8111C-VB-GR Gigabit Ethernet controller
- Choice of SATA hard drives and optical drives
- Dual Channel DDR2 SDRAM system memory (4 DIMM slots)

Overview

- 250W power supply as standard configuration (300W optional on Microtower)
- Protected by HP Services. Terms and conditions vary by country. Certain restrictions and exclusions apply.

Standard Features and Configurable Components

Processor and Speed One of the following	Intel Celeron Processors Intel Celeron 420 Processor (1.60 GHz, 512 KB L2 cache, 800 MHz FSB) Intel Celeron 430 Processor (1.80 GHz, 512 KB L2 cache, 800 MHz FSB) Intel Celeron 440 Processor (2.00 GHz, 512 KB L2 cache, 800 MHz FSB) Intel Celeron Dual Core E1200 Processor (1.60 GHz, 512 KB L2 cache, 800 MHz FSB) Intel Pentium Processors Intel Pentium Dual-Core E2160 Processor (1.80 GHz, 1 MB L2 cache, 800 MHz FSB) Intel Pentium Dual-Core E2180 Processor (2.0 GHz, 1 MB L2 cache, 800 MHz FSB) Intel Pentium Dual-Core E2200 Processor (2.2 GHz, 1 MB L2 cache, 800 MHz FSB) Intel Core 2 Processors Intel Core 2 Duo E4500 Processor (2.20 GHz, 2 MB L2 cache, 800 MHz FSB) Intel Core 2 Duo E4600 Processor (2.40 GHz, 2 MB L2 cache, 800 MHz FSB) Intel Core 2 Duo E4700 Processor (2.60 GHz, 2 MB L2 cache, 800 MHz FSB) Intel Core 2 Duo E8200 Processor (2.66 GHz, 6 MB L2 cache, 1333 MHz FSB) Intel Core 2 Duo E8400 Processor (3.00 GHz, 6 MB L2 cache, 1333 MHz FSB) Intel Core 2 Duo E8500 Processor (3.16 GHz, 6 MB L2 cache, 1333 MHz FSB) Intel Core 2 Quad E9300 Processor (2.50 GHz, 6 MB L2 cache, 1333 MHz FSB) Intel Core 2 Quad E9450 Processor (2.66 GHz, 12 MB L2 cache, 1333 MHz FSB) Intel Core 2 Quad E9550 Processor (2.83 GHz, 12 MB L2 cache, 1333 MHz FSB) Intel Core 2 Duo E6540 Processor (2.33-GHz, 4-MB L2 cache, 1333-MHz FSB-Non TXT) Intel Core 2 Duo E6550 Processor (2.33-GHz, 4-MB L2 cache, 1333-MHz FSB-TXT) Intel Core 2 Duo E6750 Processor (2.66-GHz, 4-MB L2 cache, 1333-MHz FSB) Intel Core 2 Duo E6850 Processor (3.00-GHz, 4-MB L2 cache, 1333-MHz FSB) Intel Core 2 Duo E7200 Processor (2.53-GHz, 3-MB L2 cache, 1066-MHz FSB, 3MB, 65W) Intel Core 2 Duo E7300 Processor (2.66-GHz, 3-MB L2 cache, 1066-MHz FSB, 3MB, 65W) * Intel processor numbers are not a measure of performance. Processor numbers differentiate features within each processor family, not across different processor families.

Standard Features and Configurable Components

Operating Systems and Application Software (availability varies by region)	Genuine Windows Vista Business 32* Genuine Windows Vista Business 32 (Cost Reduce) (China only) Genuine Windows Vista Home Basic 32* Genuine Windows Vista Business 32 downgrade to XP Pro Genuine Windows XP Home 32 (Cost Reduce) (China only) Red Flag Linux (China only) FreeDOS Microsoft Office 2007 Basic Microsoft Office 2007 Small Business Microsoft Office 2007 Professional Microsoft Office ready 2007 Microsoft Works 8.5 Roxio Easy Media Creator 9.x** Intervideo WinDVD Player 5.x** Jiangming antivirus - (China only, XP and Vista supportive) Symantec AntiVirus 10 SoftThinks Version 1.x for BPC (Vista) SoftThinks Version 1.x for BPC PDF Complete Sun Java Runtime Environment HP Backup and Recovery Manager * Certain Windows Vista product features require advanced or additional hardware. See http://www.microsoft.com/windowsvista/getready/hardwarereqs.mspx and http://www.microsoft.com/windowsvista/getready/capable.mspx for details. Windows Vista Upgrade Advisor can help you determine which features of Windows Vista will run on your computer. To download the tool, visit http://www.windowsvista.com/upgradeadvisor. **Supporting software available with certain optical drive configurations
Hard Drives	80-GB Serial ATA 3.0-Gb/s Hard Drive (7200 rpm) 160-GB Serial ATA 3.0-Gb/s Hard Drive (7200 rpm) 250-GB Serial ATA 3.0-Gb/s Hard Drive (7200 rpm) 500-GB Serial ATA 3.0 Gb/s Hard Driver (7200 rpm)
System Memory	512 MB DDR2 Synch DRAM PC2-6400 (800 MHz) Non-ECC (1 x 512 MB) 1 GB DDR2 Synch DRAM PC2-6400 (800 MHz) Non-ECC (2 x 512 MB) 1 GB DDR2 Synch DRAM PC2-6400 (800 MHz) Non-ECC (1 x 1 GB) 2 GB DDR2 Synch DRAM PC2-6400 (800 MHz) Non-ECC (2 x 1 GB) 2 GB DDR2 Synch DRAM PC2-6400 (800 MHz) Non-ECC (1 x 2 GB) 3 GB DDR2 Synch DRAM PC2-6400 (800 MHz) Non-ECC (3 x 1 GB) 4 GB DDR2 Synch DRAM PC2-6400 (800 MHz) Non-ECC (4 x 1 GB) 4 GB DDR2 Synch DRAM PC2-6400 (800 MHz) Non-ECC (2 x 2 GB)

Standard Features and Configurable Components

Storage – One or more of the following (see Storage section below)	Diskette Drive 1.44 MB Diskette Drive Media Reader HP 16-in-1 Media Reader and additional USB 2.0 port Optical Drives (Serial ATA) SATA DVD-ROM Drive SATA CD-RW/DVD-ROM Combo Drive SATA SuperMulti LightScribe DVD Writer Drive
Input Devices	Keyboard – One of the following HP PS/2 Standard Keyboard HP USB Standard Keyboard Mouse – One of the following PS/2 2-Button Optical Scroll Mouse USB 2-Button Optical Scroll Mouse USB 2-Button Laser Mouse
Audio	Realtek ALC662 High Definition audio codec 3D audio compliant and HD Audio compatible Internal PC speaker (optional)
Communication	Integrated Realtek 8111C-VB-GR GbE Ethernet Controller Intel PRO/1000 PT Gigabit PCIe Controller (full height for MT, low profile for SFF) Broadcom NetXtreme 5751 Gigabit PCIe Controller (full height for MT, low profile for SFF) Agere 56K PCI Modem (full height for MT, low profile for SFF)
Graphics	Intel Graphics Media Accelerator 3100 – integrated NVIDIA GeForce 8400 GS (256MB) Single Head PCIe x16 * ATI Radeon HD 2400XT (256MB DH) PCIe x16 * 1GB of system memory required. Graphics cards use part of the total system memory to enhance graphics performance.
Miscellaneous	HP FireWire / IEEE 1394 PCI Card (full height for MT, low profile for SFF) 2nd serial port

System Details

Base Unit

- MT: Micro ATX Microtower chassis, including power supply and front bezel, five (5) drive bays and four expansion slots
- SFF: Micro ATX Small Form Factor chassis, including power supply and front bezel, three (3) drive bays and four expansion slots
- Microsoft or Linux operating system CD – optional
- Active type heatsink
- 92 x 92 x 25 mm chassis fan for Microtower chassis
- 80 x 80 x 25 mm chassis fan for Small Form Facotr chassis
- System board with Intel G33 Express chipset, Intel I/O Controller Hub 9 (ICH9), Realtek RTL8111C-VB-GR GbE Ethernet controller, Intel GMA 3100 graphics, and Realtek audio, (2) full-height PCI 2.3 slots, (1) PCIe x1 slot, (1) PCIe x16 slot, (4) DDR2 DIMM memory slots, (4) Serial ATA data connectors, (1) parallel and (1) serial port in the rear
- Product documentation on CD
- HP system restore CD – optional
- Power cord

Slots

PCI	Two (2) full-height PCI 2.3 slots on PCA One (1) full-height PCI Express x1 slots on PCA One (1) full-height PCI Express x16 slot on PCA (for graphic cards)
Memory Expansion	Four (4) DDR2 SDRAM DIMM slots (4 GB maximum memory support)

NOTE: For systems configured with more than 3 GB of memory and a 32-bit operating system, all memory may not be available due to system resource requirements. Addressing memory above 4 GB requires a 64-bit operating system.

Bays (Microtower)

Internal	Two (2) 3.5-inch (8.89 cm) half height
External	Two (2) 5.25-inch (13.335 cm) half height One (1) 3.5-inch (8.89 cm) half height

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Bays (SFF)

Internal	One (1) 3.5-inch (8.89 cm) half height
External	One (1) 5.25-inch (13.335 cm) half height One (1) 3.5-inch (8.89 cm) half height

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USB Support

EHCI high-speed USB 2.0 controller

Two (2) front ports; Eight (8) rear ports, Two (2) internal ports on motherboard

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Interfaces (Legacy)

One (1) PS/2 keyboard port
One (1) PS/2 mouse port
One (1) analog VGA video port
One (1) parallel port
One (1) serial port
One (1) line in; one (1) line out; one (1) mic in
One (1) RJ45 network port

System Details

Weight & Dimensions (MT)	Chassis Dimensions (H x W x D)	15.16 x 7.28 x 16.38 in with bezel 385 x 185 x 416 mm 14.88 x 6.50 x 16.10 in without bezel 378 x 165 x 409 mm
	Packaged Dimensions (L x W x H)	19.63 x 24.13 x 10.56 in 498.6 x 613 x 268.2 mm
	System Weight	18.3 lb (8.3 kg)
	Shipping Weight	26.7 lb (12.1 kg)

Weight & Dimensions (SFF)	Chassis Dimensions (H x W x D)	3.94 x13.34 x 16.18 in 100 x 339 x 411 mm
	Packaged Dimensions (L x W x H)	19.48 x 23.425 x 8.62 in 495 x 595 x 219 mm
	System Weight	18.96 lb (8.6 kg)
	Shipping Weight	27.3 lb (12.4 kg)

Technology and Features	Memory Type	PC2-6400 DDR2 SDRAM (800MHz) non-ECC Up to 4-GB maximum system memory supported
	NOTE: For systems configured with more than 3 GB of memory and a 32-bit operating system, all memory may not be available due to system resource requirements. Addressing memory above 4 GB requires a 64-bit operating system.	
	Hard Drive Interfaces Supported	Serial ATA

System Details

Chassis	Front Panel	Power button Power On LED HDD Activity LED
	Cooling Solutions Supported	Power Supply Fan (variable speed) Active heatsink (variable speed) Chassis fan
	Slots Supported	Four (4) full-height expansion slots
	Front I/O	Two (2) USB 2.0 ports
	Rear I/O	Standard Micro ATX I/O connectors, including eight (8) USB 2.0 ports
	Drive Bays (MT)	Two (2) 5.25-inch (13.335 cm) half height external One (1) 3.5-inch (8.89 cm) half height external Two (2) 3.5-inch (8.89 cm) half height internal
	Drive Bays (SFF)	One (1) 5.25-inch (13.335 cm) half height external One (1) 3.5-inch (8.89 cm) half height external One (1) 3.5-inch (8.89 cm) half height internal
	Security	Padlock loop Kensington Lock Support
	Power Supply	250W/300-watt ATX Power Supply – PFC with a 115v/230v line switch (varies by country/region), with HV immunity up to 410V/s

Unit Environment and Operating Conditions

General Unit Operating Guidelines

- Keep the computer away from excessive moisture, direct moisture and the extremes of heat and cold, to ensure that unit is operated within the specified operating range.
- Leave a 4 in (10.2 cm) clearance on all vented sides of the computer to permit the required airflow.
- Never restrict airflow into the computer by blocking any vents or air intakes.
- Do not stack computers on top of each other or place computers so near each other that they are subject to each other's re-circulated or preheated air.
- Occasionally clean the air vents on the front, back, and any other vented side of the computer. Lint, dust and other foreign matter can block the vents and limit the airflow.
- If the computer is to be operated within a separate enclosure, intake and exhaust ventilation must be provided on the enclosure, and the same operating guidelines listed above will still apply.

Temperature Range	Operating	5° to 35° C
	Non-operating	-30° to 65° C
Relative Humidity	Operating	15% to 80% (non-condensing at ambient)
	Non-operating	90% (non-condensing at ambient)
Maximum Altitude (unpressurized)	Operating	7500 ft (2286 m)
	Non-operating	15,000 ft (4572 m)

NOTE: Operating temperature is de-rated 1.0 deg C per 1000 ft (300 m) to 7500 ft (2286 m) above sea level, no direct sustained sunlight. Maximum rate of change is 7.5 deg C/Hr. The upper limit may be limited by the type and number of options installed.

System Details

System Board	Processor	Socket T; LGA775 industry standard Micro ATX form factor Support single Intel Core 2 Duo or Quad, Pentium Dual Core, Celeron 4xx or Dual Core
	PWM	ON NCP5385 – 3 Phase
	Chipset	Intel G33 Express Intel I/O Controller Hub 9 (ICH9)
	Super I/O	ITE IT8718F
	Front Side Bus Frequency	800/1066/1333 MHz
	Memory	DDR2 SDRAM 4 x DIMM slots
	Clock Generator	ICS ICS9LP505-2HFLFT
	Integrated Graphics	Intel Graphics Media Accelerator (GMA) 3100
	Audio	Realtek ALC662-GR HD Audio compatible codec with 5.1 channel audio 3D audio
	LOM	Realtek RTL8111C-VB--GR GbE Ethernet controller
	Storage	Four Serial ATA interfaces
	Expansion Slots	2 x PCI 2.3 slots 1 x PCI Express x1 slot 1 x PCI Express x16 slot
	BIOS	SPI EEPROM
	Industrial Standard	PCI 2.3 compliant USB 2.0
	Rear Side I/O Ports	1 x PS/2 keyboard port 1 x PS/2 mouse port 8 x USB 2.0 ports 1 x RJ-45 10/100/1000 port 1 x D-sub 15 pin analog VGA port 1x D-sub 25 pin parallel (print) port 1xD-sub 9 pin serial (RS232) port 3 x audio ports
	On Board I/O Interfaces	1 x ATX power connector 1 x +12V power connector 1 x Floppy connector 1 x Front panel connector, Switch, LED (ON/Flash/OFF) 2 x Fan headers for CPU, chassis, with voltage/fan speed control 1 x header to support 2 USB 2.0 ports at front side 1 x header to support 2 front (Headphone/Mic) audio ports 1 x header to support USB media reader 1 x serial (COM2) header to support 2nd serial port
	Board Size	Micro-ATX, PCB Size: 9.6 x 9.6 in (24.38 x 24.38 cm) 4-layer PCB with green color
	Additional Features	• Bootable without keyboard, mouse or monitor • Keyboard/mouse/USB wake up • Support S1, S3, S4 and S5 • ACPI status • Hardware monitor capability • CPU fan speed control

System Details

Network Interface

Integrated Realtek 8111C-VB-GR GbE Ethernet Controller
Intel PRO/1000 PT Gigabit PCIe Adapter (optional)
Broadcom NetXtreme 5751Gigabit PCIe NIC (optional)

Power Supply

- 250W/300W ATX Power Supply – Passive PFC with a 115v/230v line switch, with HV immunity up to 410V/s
- 90 to 132VAC, or 180 to 264VAC operating voltage range
- 100 to 127VAC, or 200 to 240VAC rated voltage range
- 50–60 Hz rated line frequency
- 47–63 Hz operating line frequency range
- 250 or 300 watt maximum rated power
- High voltage immunity up to 410V/s
- 80-mm power supply fan – variable speed for optimum acoustics

Power Conservation 'Energy Saver'

- APM 1.2 support
- Screen blanking
- Hard drive 'Idle' mode
- System Idle mode
- ~3 watt power consumption in ES mode – suspend to RAM (S3) (instantly available PC)
- Processor/Cache memory power-down (S3)
- CECP – China Only (<3 w in S5 – power off)

System Environmental Specs

- Values are subject to change without notification and are for reference only.
- Performance of system, options, and ancillary equipment will vary depending on the system configuration.
- Levels presented do not account for non-HP/Compaq installed hardware.

Ambient Air Temperature	Operating	Operating 5 to 35°C (Test 0 to 40°C)
	Storage	90% RH @ 60°C for 12 hours (Non-condensing)
Humidity	Operating	15% to 80% relative humidity (Rh), 35°C non-condensing
	Storage	90% relative humidity (Rh), 60°C for 12 hours, non-condensing
Altitude	Operating	0 to 7,500 feet (0 to 2286 meters) – This value may be limited by the type and number of options installed.
	Non-Operating	0 to 15,000 feet (0 to 4572 meters)
Shock	Listed are the levels of shock the product can withstand with NO damage being incurred. The values represent peak input acceleration during a 2 to 3 ms half-sine shock pulse, 11 ms trapezoidal shock pulse.	
	Non-Operating	35G's (Half-sine Shock) 35G's (Trapezoidal Shock)
Vibration	Listed are the levels of vibration the product can withstand with NO damage being incurred. The values represent a flat random vibration input acceleration profile across the given frequency range.	

System Details

		Operating	Random Operating: ~0.21Grms (5-500 Hz) Swept Sine: 0.5g (5-500Hz) 5 min. dwell at 4 resonance's
		Non-Operating	~2.09Grms (5-500Hz), Non-Operational
	Acoustic Noise	Listed are the declared A-WEIGHTED SOUND POWER LEVELS (LWAd) and declared average desktop seated operator position A-WEIGHTED SOUND PRESSURE LEVELS (LpAm) when the product is operating in a 73.4°F (23°C) ambient environment. Noise emissions were measured in accordance with ISO 7779 (ECMA 74) and declared in accordance with ISO 9296 (ECMA 109).	
		IDLE (Fixed disk drive spinning)	LWAd = 4.3 Bels, Desktop Average LpAm = 32 dBA
		FIXED DISK (Random write)	LWAd = 4.8 Bels, Desktop Average LpAm = 37dBA
		CD-ROM (Sequential Reads)	LWAd = 5.0 Bels, Deskside Average LpAm = 39dBA
Service and Support	On-site Warranty[1]: (1-1-1, 3-1-1, 3-3-3, 4-4-4, 5-5-5, or 90-0-0) limited warranty delivers on-site, next business-day[2] service for parts and labor and includes free telephone support[3] 24 x 7. Global coverage[2] ensures that any product purchased in one country and transferred to another non-restricted country will remain fully covered under the original warranty and service offering. One-year onsite and labor are not available in all countries. [1] Terms and conditions may vary by country. Certain restrictions and exclusions apply. Other warranty variations may be offered in your region. [2] On-site service may be provided pursuant to a service contract between HP and an authorized HP third-party provider, and is not available in certain countries. Global service response times are based on commercially reasonable best effort and may vary by country. [3] Technical telephone support applies only to HP-configured Compaq and third-party HP-qualified hardware and software. Toll-free calling and 24 x 7 support may not be available in some countries.		

After-Market Options

Communications	**NICs**	
	Intel PRO/1000 PT Gigabit PCIe Controller	EH352AA
	Broadcom NetXtreme 5751 Gigabit PCIe NIC	EA833AA
	Modems	
	Agere 2006 PCI High-Speed 56K International SoftModem	EK694AA
Hard Disk Drives	HP 500 GB SATA 3.0 Gb/s Hard Drive	PV943A
	HP 250 GB SATA 3.0 Gb/s Hard Drive	PY278AA
	HP 160 GB SATA 3.0 Gb/s Hard Drive	PY277AA
	HP 80 GB SATA 3.0 Gb/s Hard Drive	PY276AA
Removable Storage Devices	**Diskette Drive**	
	HP 1.44 MB USB Diskette Drive – External	DC141B
	HP CDC 1.44 MB 3.5-inch Internal Diskette Drive	EY084AA
	16-in-1 Media Reader (Microtower only)	EM718AA
Input Devices	**Keyboards**	
	HP PS/2 Standard Keyboard	DT527A
	HP USB Standard Keyboard	DT528A
	Mice	
	HP USB 2-Button Laser Mouse	GW405AA
	HP PS/2 2-Button Optical Scroll Mouse	EY703AA
	HP USB 2-Button Optical Scroll Mouse	DC172B
Memory	HP 512 MB PC2-6400 (DDR2 800 MHz) DIMM	AH056AA
	HP 1 GB PC2-6400 (DDR2 800 MHz) DIMM	AH058AA
	HP 2 GB PC2-6400 (DDR2 800 MHz) DIMM	AH060AA
Audio	HP Satellite Speakers	KK912AA
Graphics	NVIDIA GeForce 8400 GS 256MB SH PCIe x16 Graphics Card*	GJ119AA
	ATI Radeon HD 2400 XT 256MB DH PCIe x16 Graphics Card	KD060AA
	HP ADD2 SDVO DVI-D Adapter	DY674A
	* 1GB of system memory required. Graphics cards use part of the total system memory to enhance graphics performance.	

After-Market Options

Optical Drives	HP SATA CD-RW/DVD-ROM Combo Drive	AH046AA
	HP SATA DVD-ROM Drive	AH047AA
	HP SATA SuperMulti LightScribe DVD Writer Drive	GF343AA
Security	HP Business PC Security Lock Kit	PV606AA
	Kensington Compaq Security Lock Ind - All	PC766A
Miscellaneous Accessories	HP FireWire / IEEE 1394 PCI Card	PA997A
	Tower Stand - Carbonite for SFF	DE870A

DDR SYNCH DRAM NON-ECC MEMORY

The Intel G33 Express chipset supports non-ECC DDR2 memory up to PC2-6400 (800-MHz). Memory upgrades are accomplished by adding single or multiple DIMMs of the same or varied sizes. This chart does not represent all possible memory configurations.

CAUTION: You must shut down the computer **and disconnect the power cord** before adding or removing memory modules. Regardless of the power-on state, voltage is always supplied to the memory modules as long as the computer is plugged in to an active AC outlet. Adding or removing memory modules while voltage is present may cause irreparable damage to the memory modules or system board.

HP recommends dual-channel symmetric configurations for maximum performance.

For best performance, add the same amount of total memory to each channel and do not mix speeds. For dual-channel symmetric performance, the total amount of memory in each channel must be equal. If speeds are mixed, speed will default to the slowest DIMM.

STANDARD MEMORY

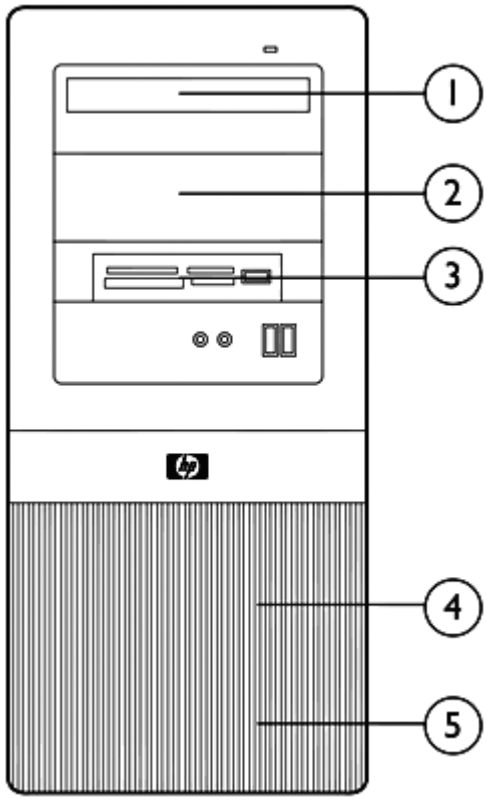
512-MB, 1-GB, 2-GB, or 4-GB DDR2 SYNCH DRAM

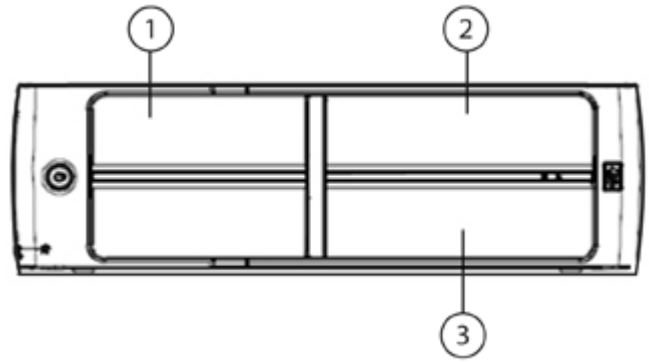
OPTIONAL MEMORY UPGRADES

Supports up to 4-GB of DDR2 SYNCH DRAM. Not all memory configurations possible are represented below.

NOTE: For systems configured with more than 3 GB of memory and a 32-bit operating system, all memory may not be available due to system resource requirements. Addressing memory above 4 GB requires a 64-bit operating system.

	Channel A		Channel B	
DIMM Size	Slot 1	Slot 2	Slot 3	Slot 4
512-MB	512-MB			
1-GB (dual-channel symmetric)	512-MB		512-MB	
1-GB	1-GB			
2-GB (dual-channel symmetric)	1-GB		1-GB	
4-GB (dual-channel symmetric)	1-GB	1-GB	1-GB	1-GB
4-GB (dual-channel symmetric)	2-GB		2-GB	





	Microtower			Small Form Factor		
	Maximum Quantity Supported	Position Supported	Controller	Maximum Quantity Supported	Position Supported	Controller
Drive Support						
Diskette Drives	1	3	SIO	1	1	SIO
Media Reader	1	3	Internal USB 2.0 port	1	1	Internal USB 2.0 port
DVD-ROM Drives	2	1, 2	SATA	1	2	SATA
CD-RW/Combo Drives	2	1, 2	SATA	1	2	SATA
SuperMulti LightScribe DVD Writer Drives	2	1, 2	SATA	1	2	SATA
3.5" (8.89 cm) Serial ATA Hard Drives	2	4, 5	SATA	1	3	SATA

Technical Specifications - Audio

Integrated Realtek ALC662-GR Audio	Type	Integrated
	HD Audio compatible codec	Yes
	Sampling (DAC and ADC)	Supports 44.1/48/96 KHz
	Audio Jacks	Mic-In
		Line-In
		Line-Out / Headphone Out
	Power Support	Digital: 3.3V
		Analog: 5V
	Other	Meets Mircrosoft Windows Vista (WLP 3.08) Premium requirements High-performance DACs with 98dB SNR(A-Weighting) ADCs with 90dB SNR(A-Weighting)

Integrated Realtek 8111C-VB-GR GbE Ethernet Controller	Connector	RJ45
	Controller	Realtek 8111C-VB-GR Gigabit Ethernet Controller
	Memory	Transmit/Receive on-chip buffer support
	Data rates supported	2.5GHz data rate with X1 link width.
	Compliance	IEEE 802.1P, 802.1Q, 802.3, 802.3AB and 802.3u compliant, 802.3x flow control
	Bus architecture	PCI Express 1.1
	Data transfer mode	DMA
	Power requirement(LOM)	1000mbps (TxRx) max.740mW 100mbps (TxRx) max.396mW 10mbps (TxRx) max.436mW D3 hot with Link (10M) 261 mW D3 hot without Link 182 mW D3 cold with Link (10M) 168 mW Link D3 cold without Link 89 mW Link
	Network transfer rate	10/100/1000 Mbps over CAT.5 100/1000 Mbps over CAT.3 10 Mbps over CAT.3
	Dimensions	9mm x 9mm
	Power Management	ACPI rev 2.0, PCI PM rev 1.1, ASPM v1.0a

Intel PRO/1000 PT Gigabit PCIe Controller	Connector	RJ-45
	Controller	Intel 82572EI Gigabit Ethernet Controller
	Memory	Integrated Dual 48K configurable transmit receive FIFO Buffers
	Data rates supported	10/100/1000 Mbps
	Compliance	IEEE 802.1P, 802.1Q, 802.3, 802.3AB and 802.3u compliant, 802.3x flow control
	Bus architecture	PCI Express 1.0a
	Data transfer mode	Bus-master DMA
	Hardware certifications	FCC, B, CE, TUV- cTUVus Mark Canada and United States, TUV- GS Mark for European Union
	Power requirement	Aux 3.3V, 3.0 Watts in 1000base-T and 2.0 Watts in 100Base-T
	Boot ROM support	Yes
	Network transfer rate	10BASE-T (half-duplex) 10 Mbps 10BASE-T (full-duplex) 20 Mbps 100BASE-TX (half-duplex) 100 Mbps 100BASE-TX (full-duplex) 200 Mbps 1000BASE-T (full-duplex) 2000 Mbps (actual rate limited by PCI Bus)
	Environmental	Operating temperature 32° to 131°F (0° to 55° C) Operating humidity 85% at 131° F (55° C)
	Dimensions	6.4 x 2.6 x 0.8 in (16.3 x 6.6 x 1.9 cm)

	Management capabilities	ASF, WOL, PXE, DMI, WFM 2.0.
Broadcom NetXtreme 5751 Gigabit Ethernet PCIe x1 Controller	Connector	RJ-45
	Controller	Broadcom 5751 PCI-Express LAN Controller
	Memory	Integrated 96Kb frame buffer memory
	Data rates supported	10/100/1000 Mbps
	Compliance	IEEE 802.1P, 802.1Q, 802.2, 802.3, 802.3AB and 802.3u compliant, 802.3x flow control
	Bus architecture	PCI-E
	Data path width	Single channel, PCI-E
	Data transfer mode	Bus-maSFFer DMA
	Hardware certifications	FCC, B, CE, TUV- cTUVus Mark Canada and United States, TUV- GS Mark for European Union
	Power requirement	3.1 watts @ +3.3V AUX supply with 5V tolerance
	Boot ROM support	Yes
	Network transfer mode	Full-duplex
		Half-duplex (not available for the 1000BASE-T transceiver)
	Network transfer rate	10BASE-T (half-duplex) 10 Mbps
		10BASE-T (full-duplex) 20 Mbps
		100BASE-TX (half-duplex) 100 Mbps
		100BASE-TX (full-duplex) 200 Mbps
		1000BASE-T (full-duplex) 2000 Mbps
	Environmental	Operating temperature
	Management capabilities	ACPI, WOL and DMI 2.0, PXE 2.0, WfM 2.0, Broadcom mgmt utility
	Alerting	N/A
	Kit contents	Broadcom 5751, CD, Broadcom NetXtreme Gigabit Ethernet PCI-E Adapter, drivers, quick install guide, product warranty Statement

Technical Specifications - Communications

Agere 56K PCI Modem	Data Transmission	56,000 Kbps maximum downstream data NOTE: 56 Kbps technology refers to download speeds only and requires compatible modems at server sites. Other conditions may limit modem speed. FCC limitations allow a maximum of 53 Kbps during download transmissions.
	Data Speeds	(Upload only) 33,600/31,200/28,800/26,400/21,600/19,200/16,800/14,400/12,000/9,600/7,200/4,800/2,400/1,200/300
	Data Standards	ITU-T V.90, ITU-T, ITU-T V.34, V.44, V.42, V.42bis21, V.32bis, Bell 212A, and Bell 103
	Fax Speeds	14,400/12,000/9,600/7,200/4,800/2,400/300 b/s
	Fax Mode Capabilities	ITU-T T.31 class 1 FAX, V. 17, V.29, V.27ter, and V.21 Channel 2
	Error Correction and Data Compression	V.44, 42bis, V.42 and MNP2-5
	Power Management	ACPI; PPMI 1.1 and wake support with PME and Vaux; meets PCI 2.3 requirements and PC 2001 requirements
	Upgradeability	Driver upgradeable for future enhancements
	Video	ITU-T V.80 video ready interface
	Other	TIA/EIA 602 standard AT command set Integrated DTE interface with speeds of up to 115.2 Kbps, parallel 16550a UART-compatible interface Optional ring wakeup signal
	Operating Temperature	32° to 158° F (0° to 70° C)
	Operating Humidity	20% to 90%, non-condensing
	Power	Requires a 3.3-V auxiliary power rail on PCI bus Uses only one PCI load (i.e., one grant/request pair), one shared IRQ, one electrical load
	Chipset	Agere Systems SV92PL – Integrated PCI interface with 5-V tolerant buffers and CardBus support
	Dimensions (L X H)	Complies with PCI low profile specifications-6.7 x 2.3 in (17.0 x 5.8 cm) and supports high- and low-profile brackets
	Connection	Single RJ-11 connector
	Other Features	Digital line protection, call progress monitoring via on-board piezo device, support for high profile and low profile brackets, PnP ID support
	Safety	UL recognized to UL 1950, 3rd edition (U.S. and Canada); IEC 950 (TUV, NEMKO, DEMKO, SEMKO); CE Mark, EC 950 (TUV, NEMKO, DEMKO, SEMKO, CE mark
	EMC	FCC Part 15, IC ES003, EN 55022, 3rd edition, EN 55024, annex A, EN 61000-4-6, EN 61000-4-8
	Telecom	FCC Part 68, IC-CS-03 (Canada); Worldwide PTT approvals Not available in Korea or the Republic of South Africa.
	Health	Bare PCB material compliant to 94V-0 or better (marked as such)
	Other	PC 2001 compliant, PCI version 2.3, WHQL approved; ACPI compliant

Integrated Graphics Media Accelerator 3100	3D/2D Controller	Microsoft DirectX® 9 based with support for Pixel Shader 2.0, 4:1 anisotropic filtering, Gaussian texture filtering, shadow maps, volumetric textures, double-sided stencil buffers, and 4 pixel pipes.
	VGA Controller	Integrated
	Bus Type	PCI Express™ x16 (If an external graphics card is installed in a PCI slot, the internal graphics can be enabled or disabled using the system's BIOS setup utility. If an external graphics card is installed in the PCI Express™ slot, the internal graphics cannot be enabled).
	RAMDAC	Integrated, 350 MHz
	Memory	Graphics memory is shared with system memory. Graphics memory usage varies depending on the amount of system memory installed and system load. 8 MB is pre-allocated for graphics use at system boot time. Additional memory is allocated for graphics as needed using Intel's Dynamic Video Memory Technology (DVMT), to provide an optimal balance between graphics and system memory use. System memory equal or greater than 512 MB 8 MB pre-allocated + 248 MB DVMT = max frame buffer of 256 MB
	Controller Clock Speed	400 MHz
	Overlay Planes	Single overlay support with 5x3 filtering
	Maximum Color Depth	32 bits/pixel
	Maximum Vertical Refresh Rate	Analog: up to 2048x1536 @ 75 Hz Flat Panel: 1920 x 1200 @ 60 Hz or digital CRT/HDTV at 1400 x1050 @ 85 Hz Varies with mode and configuration. See table below.
	Multi-display Support	Support for one CRT via the motherboard's VGA connector. Support for an additional DVI-D display via the optional DVI ADD2 card. Dual independent displays and dual synchronous (Twin or Clone mode) displays are supported.
	Graphics/Video API Support	Microsoft DirectX®9, DirectXVA®, VMR9, GDI/GDI+; OpenGL® 1.4.

Resolutions Supported[1]

Resolution	Maximum Refresh Rate (Hz)	
	Analog Monitor	Digital Monitor
640 x 480	85	60
800 x 600	85	60
1024 x 768	85	60
1280 x 1024	85	60
1600 x 1200	85	60
1920 x 1080	85	60
1920 x 1200	85	60
1920 x 1440	85	N/A
2048 x 1536	75	N/A

Technical Specifications - Graphics

[1] Modes listed are supported with a single active display. The supported mode list for multiple active displays is a subset of this list. Not all modes will support video playback and some supported modes may use software MC (motion compensation) rather than hardware MC. Not all modes will support 3D acceleration depending on the system configuration (e.g., resolution selected, size of frame buffer, number of installed memory modules, etc.).
NOTE: Other resolutions and refresh rates may be selectable but are not recommended.

NVIDIA GeForce 8400 GS (256 MB SH) PCIe x16 Graphics Controller	Bus type	PCI Express (x16 lanes)
	Maximum vertical refresh rate	85 Hz
	Display support	Integrated 400 MHz RAMDAC
	Display max resolution	2048 x 1536 (analog), 2560 x 1600 (digital)
	Input/Output connectors	DVI-I (DVI port supports dual-link and HDCP) TV-out (4 pin S-video)
	Board display options	DVI-I + TV DVI-I supports analog CRT or flat panel or digital flat panel (using DVI-A, DVI-D or DVI-I connector) DVI-I supports analog CRT or flat panel (with VGA connector and DVI-I to VGA dongle) TV connector is a 4-pin mini-DIN S-video connector
	Board configuration	Specification: Description
		Graphics Chip: NVIDIA GeForce 8400 GS
		Core clock: 460 MHz
		Memory clock: 200 MHz
		Frame buffer: 256 MB DDR2
	Languages supported	24 languages: English, Arabic, Chinese Simplified, Chinese Traditional, Czechoslovakian, Danish, Dutch, Finnish, French, German, Greek, Hebrew, Hungarian, Italian, Japanese, Korean, Norwegian, Polish, Portuguese, Russian, Spanish, Swedish, Thai, Turkish
	Core power	25 W (Max board power)

NVIDIA GeForce 8400 GS (256 MB SH) PCIe x16 Graphics Controller display resolutions and refresh rates

NOTE: Other resolutions may be available but are not recommended as they may not have been tested and qualified by HP.

Technical Specifications - Graphics

Analog Resolution	Maximum Refresh Rate
640 x 480	85 Hz
800 x 600	85 Hz
1024 x 768	85 Hz
1280 x 1024	85 Hz
1600 x 1200	85 Hz
1920 x 1080	85 Hz
1920 x 1200	85 Hz
1920 x 1440	85 Hz
2048 x 1536	85 Hz
Digital Resolution	**Maximum Refresh Rate**
640 x 480	60 Hz
800 x 600	60 Hz
1024 x 768	60 Hz
1280 x 1024	60 Hz
1600 x 1200	60 Hz
1920 x 1200*	60 Hz
1920 x 1440**	60 Hz
2560 x 1600**	60 Hz
* Reduced blanking timings used when connected to a single-link DVI monitor ** Requires a dual-link DVI capable monitor	

HP ADD2 SDVO PCIe x16 DVI-D Adapter

Models	HP ADD2 SDVO DVI-D Out Adapter
Form Factor	Low-profile card
DVI-D Connector	Digital connection only
Dual Head Support	Yes, when used with the integrated VGA connector
Display Devices Supported	HP L1740 HP L1940T HP L2045W HP LP1965

NOTE: These graphics adapters offer optimal performance with any display that meets applicable VESA standards.

Color Depth	All modes support 8-bpp, 16-bpp, and 24-bpp color depths
Host Interface Connector	Mechanically compliant with PCI-E standard Complies with the Intel ADD2 and Intel Serial Digital Video Output (SDVO) specifications
Dot Clock	165 MHz maximum
Display Modes	Supports display modes that require up to 165-MHz bandwidth on the link, as shown in the following table.

Technical Specifications - Graphics

Resolution		60-Hz LCD	60-Hz	75-Hz	85-Hz
Blanking		5% reduced	GTF	GTF	GTF
640 x 480	VGA	Yes	Yes	Yes	Yes
800 x 600	SVGA	Yes	Yes	Yes	Yes
1024 x 768	XGA	Yes	Yes	Yes	Yes
1280 x 1024	SXGA	Yes	Yes	No	No
1600 x 1200	UXGA	Yes	Yes	No	No

ATI Radeon HD 2400XT (256MB DH) PCIe Graphics Card

Bus Type	PCI Express (x16 lanes)
Maximum Vertical Refresh Rate	85 Hz
Display Support	Integrated 400 MHz RAMDAC
Display Max Resolution	2560 x 1600 digital, 2048 x 1536 analog
Board Display Options	Supports two displays via included DMS-59 to dual VGA cable or 2 DVI monitors via optional DMS-59 to dual DVI cable kit part number: DL139A. 4-pin mini-DIN S-video connector for TV output

Board configuration	**Specification**	**Description**
	Graphics Chip	RV610
	Core clock	650 MHz
	Memory clock	500 MHz
	Frame buffer	256 MB DDR2, 128 bit wide

Languages supported	24 languages: English, Arabic, Chinese Simplified, Chinese Traditional, Czechoslovakian, Danish, Dutch, Finnish, French, German, Greek, Hebrew, Hungarian, Italian, Japanese, Korean, Norwegian, Polish, Portuguese, Russian, Spanish, Swedish, Thai, Turkish
Core Power	21 W
Compliance standards	EMC Emissions: a) FCC Part 15, Subpart B – Unintentional Radiators, Class B Computing Devices for Home & Office Use b) CISPR22: 1997/EN 55022:1998 – Class B – Limits and methods of measurement of radio disturbance characteristics of Information Technology Equipment c) Canadian Standard ICES-003 is equivalent to CISPR22 d) Taiwanese Standard BSMI e) Japanese VCCI f) Australian C-Tick g) Korean (MIC) EMC Immunity: CISPR 24:1997/EN 55024:1998 – Information Technology Equipment – Immunity Characteristics – Limits and Methods of Measurement.

ATI Radeon HD 2400XT (256MB DH) PCIe Graphics Card display resolutions and refresh rates

NOTE: Other resolutions may be available but are not recommended as the may not have been tested and qualified by HP

Technical Specifications - Graphics

Analog Resolution	Maximum Refresh Rate
640 x 480	85 Hz
800 x 600	85 Hz
1024 x 768	85 Hz
1280 x 768	85 Hz
1280 x 1024	85 Hz
1600 x 1024	85 Hz
1600 x 1200	85 Hz
1920 x 1080	85 Hz
1920 x 1200	75 Hz
1920 x 1440	85 Hz
2048 x 1536	75 Hz
Digital Resolution	Digital Resolution
640 x 480	60 Hz
800 x 600	60 Hz
1024 x 768	60 Hz
1280 x 768	60 Hz
1280 x 1024	60 Hz
1600 x 1024	60 Hz
1600 x 1200	60 Hz
1920 x 1200	60 Hz

HP PS/2 or USB Standard Keyboard	Physical characteristics	Keys	104, 105, 106, 107, 109 layout (depending upon country)
		Dimensions (L x W x H)	18.0 x 6.4 x 0.98 in (45.8 x 16.3 x 2.5 cm)
		Weight	2 lb (0.9 kg) minimum
	Electrical	Operating voltage	+ 5VDC ± 5%
		Power consumption	50-mA maximum (with three LEDs ON)
		ESD	CE level 4, 15-kV air discharge
		EMI – RFI	Conforms to FCC rules for a Class B computing device
		MicrosoftPC 99 – 2001	Functionally compliant
	Mechanical	Languages	38 available
		Keycaps	Low-profile design
		Switch actuation	55-g nominal peak force with tactile feedback
		Switch life	20 million keystrokes (using Hasco modified tester)
		Switch type	Contamination-resistant switch membrane
		Key-leveling mechanisms	For all double-wide and greater-length keys
		Cable length	6 ft (1.8 m)
		Microsoft PC 99 – 2001	Mechanically compliant
		Acoustics	43-dBA maximum sound pressure level
	Environmental	Operating temperature	50° to 122° F (10° to 50° C)
		Non-operating temperature	-22° to 140° F (-30° to 60° C)
		Operating humidity	10% to 90% (non-condensing at ambient)
		Non-operating humidity	20% to 80% (non-condensing at ambient)
		Operating shock	40 g, six surfaces
		Non-operating shock	80 g, six surfaces
		Operating vibration	2-g peak acceleration
		Non-operating vibration	4-g peak acceleration
		Drop (out of box)	26 in (66 cm) on carpet, six-drop sequence
		Drop (in box)	42 in (107 cm) on concrete, 16-drop sequence
	Approvals	UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BSMI, C-Tick, MIC	
	Ergonomic compliance	ANSI HFS 100, ISO 9241-4, and TUVGS	

Technical Specifications - Input Devices

HP USB 2-Button Laser Mouse	Scroll Wheel	24	
	Maximum Rotation Speed	48 rats/sec	
	Switch Type	wheel	
	Switch Life	Button -3,000,000 Wheel – 1,000,000 times Tilt switch – 500,000 times	
	Mechanical Life	200,000 revolutions	
	Environmental	Operating Temperature	0 degC – 40 degC
		Non-operating Temperature	-20 degC – 60 degC
		Operating Humidity	10% to 90% (non-condensing at ambient)
		Non-operating Humidity	20% to 80% (non-condensing at ambient)
		Operating Shock	40 g, six surfaces
		Non-operating Shock	80 g, six surfaces
		Operating Vibration	2-g peak acceleration
		Non-operating Vibration	4-g peak acceleration
	Electrical	Operating Voltage	+ 5VDC ± 5%
		Power Consumption	
		MTBF	> 150,000 hrs
		ESD	IEC-61000-4-2 criteria B, Contact discharge: +/- 4kV, Air discharge: +/- 8kV
		EMI-RFI	FCC Class B
		PC98	PC 99 Compliant
	Mechanical	Resolution	800dpi
		Tracking Speed	25cm/sec
		Acceleration	0.5mm
		Switch Actuation	0.6N (60gf)
		Switch Life	Button -3,000,000 Wheel – 1,000,000 times Tilt switch – 500,000 times
		Cable Length	1850mm
		PC98-99	PC99 compliant
	Regulatory Approvals	UL60950-1, UL 94, UL 746 (A-E), UL 796 TUV/GS: EN 60950-1, EN 60825-1 FCC Class B, UL 1950, cUL, TUV GS, CE, C-tick, VCCI, BSMI, RRL	

Serial ATA Hard Drives (7200 rpm)	80 GB	Capacity	80,026,361,856 bytes	
		Height	1 in (2.54 cm)	
		Width	Media diameter: 3.5 in (8.89 cm) Physical size: 4 in (10.2 cm)	
		Interface	Serial ATA (3.0 Gb/s)	
		Synchronous Transfer Rate (Maximum)	3.0 Gb/s	
		Buffer	8 MB	
		Seek Time (typical reads, includes controller overhead, including settling)	Single Track	2.0 ms
			Average	11 ms
			Full-Stroke	21 ms
		Rotational Speed	7,200 rpm	
		Logical Blocks	156,301,488	
		Operating Temperature	32° to 140° F (0° to 60° C)	
	160 GB	Capacity	160,041,885,696 bytes	
		Height	1 in (2.54 cm)	
		Width	Media diameter: 3.5 in (8.89 cm) Physical size: 4 in (10.2 cm)	
		Interface	Serial ATA (3.0 Gb/s)	
		Synchronous Transfer Rate (Maximum)	3.0 Gb/s	
		Buffer	8 MB	
		Seek Time (typical reads, includes controller overhead, including settling)	Single Track	2.0 ms
			Average	11 ms
			Full-Stroke	21 ms
		Rotational Speed	7,200 rpm	
		Logical Blocks	312,581,808	
		Operating Temperature	32° to 140° F (0° to 60° C)	
	250 GB	Capacity	250,059,350,016 bytes	
		Height	1 in (2.54 cm)	
		Width	Media diameter: 3.5 in (8.89 cm) Physical size: 4 in (10.2 cm)	
		Interface	Serial ATA (3.0 Gb/s)	
		Synchronous Transfer Rate (Maximum)	3.0 Gb/s	
		Buffer	8 MB	
		Seek Time (typical reads, includes controller overhead, including settling)	Single Track	2.0 ms
			Average	11 ms
			Full-Stroke	21 ms

	Rotational Speed	7,200 rpm	
	Logical Blocks	488,397,168	
	Operating Temperature	41° to 131° F (5° to 55° C)	
500 GB	Capacity	500,107,862,016 bytes	
	Height	1 in (2.54 cm)	
	Width	Media diameter: 3.5 in (8.89 cm) Physical size: 4 in (10.2 cm)	
	Interface	Serial ATA (3.0 Gb/s)	
	Synchronous Transfer Rate (Maximum)	3.0 Gb/s	
	Buffer	8 MB	
	Seek Time (typical reads, includes controller overhead, including settling)	Single Track	2.0 ms
		Average	11 ms
		Full-Stroke	21 ms
	Rotational Speed	7,200 rpm	
	Logical Blocks	976,773,168	
	Operating Temperature	41° to 131° F (5° to 55° C)	

SATA DVD-ROM Drive	Height	5.25-inch, half-height, tray-load		
	Orientation	Either horizontal or vertical		
	Interface type	SATA/ATAPI		
	Disc capacity	Single layer: Up to 4.7 GB (6 times capacity of CD-ROM) Double layer: Up to 8.5 GB (12 times capacity of CD-ROM)		
	Dimensions (W x H x D)	5.9 x 1.7 x 8.0 in (15.0 x 4.4 x 20.3 cm)		
	Weight (max)	2.6 lb (1.2 kg)		
	Read speeds	DVD+R/-R/+RW/ -RW/+R DL /-R DL	Up to 8X	
		DVD-ROM	Up to 16X	
		DVD-RAM	Up to 4X	
		CD-ROM, CD-R	Up to 48X	
		CD-RW	Up to 32X	
	Removable Storage - Media Compatibility - DVD-ROM	Media	Read	Write
		CD-ROM	Yes	No
		CD-R	Yes	No
		CD-RW	Yes	No
		DVD-ROM	Yes	No
		DVD-ROM DL	Yes	No
		DVD-RAM	Yes	No
		DVD+R	Yes	No
		DVD+R DL	Yes	No
		DVD+RW	Yes	No
		DVD-R	Yes	No
		DVD-RW	Yes	No
		DVD-R DL	Yes	No
	Access times (typical reads, including setting)	Random	DVD: < 140 ms (typical), CD: < 125 ms (typical)	
		Full Stroke	DVD: < 250 ms (seek), CD: < 210 ms (seek)	
		Cache Buffer	2 MB (minimum)	
		Data Transfer Modes	ATA PIO mode 4 (16.7 MB/s); ATA Multi-word DMA mode 2 (16.7 MB/s); ATA UltraDMA Mode 3 (44.4 MB/s -default)	
	Power	Source	SATA DC power receptacle	
		DC Power Requirement	5 VDC ± 5%-100 mV ripple p-p 12 VDC ± 5%-200 mV ripple p-p	
		DC Current	5 VDC – <1000 mA typical, < 1600 mA maximum 12 VDC –< 600 mA typical, < 1400 mA maximum	

	Environmental (all conditions non-condensing)	Temperature	41° to 122° F (5° to 50° C)
		Relative Humidity	10% to 90%
		Maximum Wet Bulb Temperature	86° F (30° C)
SATA CD-RW/DVD-ROM Combo Drive	Height		5.25-inch, half-height, tray-load
	Orientation		Either horizontal or vertical
	Interface type		SATA/ATAPI
	Disc capacity		Single layer: Up to 4.7 GB (6 times capacity of CD-ROM) Double layer: Up to 8.5 GB (12 times capacity of CD-ROM)
	Dimensions (W x H x D)		5.9 x 1.7 x 8.0 in (15.0 x 4.4 x 20.3 cm)
	Weight (max)		2.6 lb (1.2 kg)
	Write speeds	CD-R	Up to 48X
		CD-RW	Up to 32X
	Read speeds	DVD+R/-R/+RW/ -RW/+R DL /-R DL	Up to 8X
		DVD-ROM	Up to 16X
		CD-ROM, CD-R	Up to 48X
		CD-RW	Up to 32X
	Access times (typical reads, including setting)	Random	DVD: < 140 ms (typical), CD: < 125 ms (typical)
		Full Stroke	DVD: < 250 ms (typical), CD: < 210 ms (typical)
	Power	Source	SATA DC power receptacle
		DC Power Requirement	5 VDC ± 5%-100 mV ripple p-p 12 VDC ± 5%-200 mV ripple p-p
		DC Current	5 VDC - <1000 mA typical, < 1600 mA maximum 12 VDC -< 600 mA typical, < 1400 mA maximum
	Environmental (all conditions non-condensing)	Temperature	41° to 122° F (5° to 50° C)
		Relative Humidity	10% to 90%
		Maximum Wet Bulb Temperature	86° F (30° C)

Technical Specifications - Optical Storage

HP SATA SuperMulti LightScribe DVD Writer Drive	Height	5.25-inch, half-height, tray-load	
	Orientation	Either horizontal or vertical	
	Interface type	SATA/ATAPI	
	Disc capacity	8.5 GB DL or 4.7 GB standard	
	Dimensions (W x H x D)	5.9 x 1.7 x 8.0 in (15.0 x 4.4 x 20.3 cm)	
	Weight (max)	2.6 lb (1.2 kg)	
	Write speeds	DVD-RAM	Up to 12X
		DVD+R	Up to 16X
		DVD+RW	Up to 8X
		DVD+R DL	Up to 8X
		DVD-R DL	Up to 8X
		DVD-R	Up to 16X
		DVD-RW	Up to 6X
		CD-R	Up to 48X
		CD-RW	Up to 32X
	Read speeds	DVD-RAM	Up to 12X
		DVD+RW, DVD-RW, DVD+R DL, DVD-R DL	Up to 8X
		DVD-ROM DL	Up to 8X
		DVD-ROM, DVD+R, DVD-R	Up to 16X
		CD-ROM, CD-R	Up to 48X
		CD-RW	Up to 32X
	Access times (typical reads, including setting)	Random	DVD: < 140 ms (typical), CD: < 125 ms (typical)
		Full Stroke	DVD: < 250 ms (seek), CD: < 210 ms (seek)
	Power	Source	SATA DC power receptacle
		DC Power Requirement	5 VDC ± 5%-100 mV ripple p-p 12 VDC ± 5%-200 mV ripple p-p
		DC Current	5 VDC - <1000 mA typical, < 1600 mA maximum 12 VDC -< 600 mA typical, < 1400 mA maximum
	Environmental (all conditions non-condensing)	Temperature	41° to 122° F (5° to 50° C)
		Relative Humidity	10% to 90%
		Maximum Wet Bulb Temperature	86° F (30° C)

Technical Specifications - Removable Storage

HP 1.44-MB Diskette Drive	Size	3.5 in (8.89 cm)	
	LED Indicators (front panel)	Green	
	Read/Write Capacity per Diskette (high/low)	1.44 MB/720 KB	
	Drive Height	One-third	
	Drive Rotation	300 rpm	
	Transfer Rate (high/low)	500/250 KB/s	
	Bytes/Sector	512	
	Sectors/Track (high/low)	18/9	
	Tracks/Side (high/low)	80/80	
	Access Times	Track-to-Track (high/low)	3/6 ms
		Average (high/low)	94/173 ms
		Settling Time	15 ms
		Latency Average	100 ms
	Cylinders (high/low)	80/80	
	Read/Write Heads	Two	

HP 16-in-1 Media Card Reader	USB interface	USB 2.0 High-speed device via PCI card or pass -through via internal USB port of system board
	Advance protocol support	• Supports hardware ECC (Error Correction Code) function • Supports hardware CRC (Cyclic Redundancy Check) function • Supports MS 4-bit parallel transfer mode • Supports MS-PRO 4-bit parallel transfer mode • Supports SD 4-bit parallel transfer mode • Supports high-speed 50 MHz SD 4-bit card (version 1.1) • Support high-speed 52 MHz MMC 8-bit card (version 4.x)
	Supported media types	• Supports CompactFlash Card Type I (CF I), CompactFlash Card Type II (CF II),MicroDrive (MD) • Supports 3.3V SmartMedia Card (SM), SmartMedia ROM (SM ROM), xD-Picture Card (xD) • Supports Secure Digital Card (SD), Secure Digital ROM Card (SD ROM), miniSD, MultiMediaCard (MMC), Secure MultiMediaCard (Secure MMC), ROM Type MultiMediaCard (MMC ROM), Reduced Size MultiMediaCard (RS MMC), MultiMediaCard 4.0 (MMC Plus), Reduced Size MultiMediaCard 4.0 (MMC Mobile) • Support Memory Stick (MS), Memory Stick ROM (MS ROM), MagicGate Memory Stick (MG), Memory Stick Select, Memory Stick Duo (MS Duo), Memory Stick PRO (MS-PRO), Memory Stick PRO Duo (MS PRO Duo)
	Mechanical	Length (3.5"(8.89 cm)) 124.7 cm Width (3.5"(8.89 cm)) 101.6 cm Height (3.5"(8.89 cm)) 25.4 cm

	Length (5.25"(13.335 cm))	171.6 cm
	Width (5.25"(13.335 cm))	148.9 cm
	Height (5.25"(13.335 cm))	42.7 cm
Environmental	**Operational environmental extremes**	Test Parameters/Conditions - Power applied, unit operating on system ±5% nominal supply voltage. 10°C 10% R.H. = 24 hours 10°C 90% R.H. = 24 hours 20°C 90% R.H. = 24 hours 30°C 90% R.H. = 24 hours 40°C 90% R.H. = 24 hours 50°C 90% R.H. = 24 hours 50°C 10% R.H. = 24 hours
	Storage environmental extremes	Test Parameters/Conditions 60°C @ 80% R.H. for 96 hours -30°C @ 20% R.H. for 48 hours No power applied Delta °C < 1.0°C/min Delta % R.H. < 1.5% R.H./min
Approvals	USB-IF, WHQL, Compliant with USB Mass Storage Class Bulk only Transport Specification Rev. 1.0, Compliant Intel Front Panel I/O Connectivity Design Guide V. 1.2 FCC, CE, BSMI, C-Tick, VCCI, MIC, cUL, TUV-T	

Eco-Label Certifications & declarations	This product has received or is in the process of being certified to the following approvals and may be labeled with one or more of these marks:
Hewlett-Packard Corporate Environmental Information	For more information about HP's commitment to the environment: Global Citizenship Report http://www.hp.com/hpinfo/globalcitizenship/gcreport/index.html Eco-label certifications http://www.hp.com/hpinfo/globalcitizenship/environment/productdesign/ecolabels.html ISO 14001 certificates: http://www.hp.com/hpinfo/globalcitizenship/environment/operations/envmanagement.html

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